

REMARKS

Entry of the foregoing amendment is respectfully requested to place the application in condition for allowance. Claims 1-60 and 62-82 are pending in the application. Claim 79 is rejected under 35 U.S.C. § 112, second paragraph. Claims 22-28 and 30-37 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Claims 1-5, 8-10, and 13 are rejected under 35 U.S.C. § 102(b) as being anticipated by Kita et al. (JP 2000-334881 and its English abstract) (hereinafter "Kita"). Claims 60, 63, and 64 are rejected under 35 U.S.C. § 102(b) as being anticipated by United States Patent No. 5,945,250 to Aoi et al. (hereinafter "Aoi"). Claims 72 and 73 stand rejected under 35 U.S.C. § 102(e) as being anticipated by United States Patent No. 6,696,148 B1 to Seino et al. (hereinafter "Seino"). Claim 12 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Kita. Claims 6, 7, 11, 14-21, 62, 74-78, and 80-82 are objected to as being dependent on a rejected base claim. Claims 29, 38-59, and 65-71 are allowed in the application.

Applicant has cancelled claims 1-5, 8-10, 12, 13, 60, 63, and 64 without prejudice to their reintroduction in a continuation application, in order to obtain earlier allowance of the remaining claims. Applicant has amended claims 6, 11, 14, 22, 62, 72, 73, and 79. Support for the foregoing claim amendments is found throughout the specification and is discussed further below. Consideration of the pending claims is respectfully requested in view of the following comments.

Claim 79 and 35 U.S.C. § 112, Second Paragraph

The Examiner rejected claim 79 under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. Specifically, the Examiner stated that claim 79 recites a limitation for which there is insufficient antecedent basis. Applicant respectfully traverses this rejection.

Claim 79 depends from claim 14. Claim 14 has been amended in compliance with the Examiner's suggestion¹ to recite:

A lithographic process comprising:

exposing a lithographic recording medium to radiation to form a pattern;

and

developing the pattern;

wherein the lithographic recording medium comprises a nanocomposite resist comprising a nanoparticle component and a polymer component.

Additionally, Applicant has amended claim 79 to recite:

The lithographic process of claim 14, wherein the nanoparticle component comprises a polyhedral oligosilsesquioxane comprising a compound of formula $\text{Si}_8\text{O}_{12}(\text{OR})_8$, $\text{Si}_8\text{O}_{12}\text{R}_8$, $\text{Si}_{12}\text{O}_{18}(\text{OR})_{12}$, or $\text{Si}_{12}\text{O}_{18}\text{R}_{12}$, wherein R is selected from alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, silyl, substituted silyl, aryl, substituted aryl, aralkyl, substituted aralkyl, alkenyl, or substituted alkenyl.

Support for this amendment is found in the specification on page 9, line 25 through page 10, line 10. The amendment to claim 79 renders the present rejection moot. Each limitation of claim 79 has a proper antecedent basis thereby particularly pointing out and distinctly claiming the subject matter which the applicant regards as the invention in compliance with § 112, second paragraph. As a result, the Applicant respectfully requests that the rejection of claim 79 be withdrawn.

Claims 22-28 and 30-37 and 35 U.S.C. § 112, First Paragraph

Claims 22-28 and 30-37 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Specifically, the Examiner

¹ See Final Office Action Mailed June 25, 2004, page 6.

stated that no support for the amendment to claim 22 can be found in the original disclosure.

Applicant has currently amended claim 22 to recite a methacrylate component wherein the methacrylate component does not comprise a polyhedral oligosilsesquioxane moiety. Support for the current amendment to claim 22 is found in the specification on page 15, line 10 through page 16, line 25, Example 7, Example 8, and in Figure 1.

While there is no *in haec verba* requirement, newly added claim limitations must be supported in the specification through express, implicit, or inherent disclosure.²

Applicant respectfully asserts that the current amendment to claim 22 complies with this requirement. Lines 10-28 on page 15 of the specification describe a polymeric chemically amplified resist comprising a methacrylate component and a oligosilsesquioxane component wherein the methacrylate component does not comprise a polyhedral oligosilsesquioxane moiety. According to lines 10-28, the methacrylate component is typically a combination of more than one methacrylate compound, and typically is selected from methyl methacrylate, t-butyl methacrylate, methacrylic acid or combinations thereof. Noticeably, the delineation of compounds suitable for serving as the methacrylate component does not include a methacrylate compound comprising an oligosilsesquioxane moiety. Moreover, the polyhedral oligosilsesquioxane component of the polymeric resist is selected from 3-(3,5,7,9,11,13,15-heptacyclopentylpentacyclo-[9.5.1.1^{3,9}.1^{5,15}.1^{7,13}]octasiloxane-1-yl)propyl methacrylate; 3-[(3,5,7,9,11,13,15-heptacyclopentylpentacyclo-[9.5.1.1^{3,9}.1^{5,15}.1^{7,13}]-octasiloxan-1-yloxy)dimethylsilyl]propyl methacrylate; 1,3,5,7,9,11,13-heptacyclopentyl-15vinylpentacyclo-[9.5.1.1^{3,9}.1^{5,15}.1^{7,13}]octasiloxane, or combinations thereof.

Furthermore, lines 5-15 on page 16 of the specification provide a specific example of a polymeric chemically amplified resist consistent with that described in lines 10-28 on page 15. The polymeric chemically amplified resist comprises a methacrylate component comprising methyl methacrylate (MMA), t-butyl methacrylate (TBMA), and methacrylic acid (MAA). The polyhedral oligosilsesquioxane component comprises 3-(3,5,7,9,11,13,15-heptacyclopentylpentacyclo-[9.5.1.1^{3,9}.1^{5,15}.1^{7,13}]octasiloxane-1-yl)propyl methacrylate (propyl methacrylate POSS). The present polymeric chemically

² Manual of Patent Examining Procedure § 2163 (I)(B).

amplified resist is additionally illustrated in Figure 1. As demonstrated in this specific example, the methacrylate component of the polymeric resist does not comprise a polyhedral oligosilsesquioxane moiety.

In view of the foregoing discussion, Applicant respectfully asserts that the amendment to claim 22 reciting a methacrylate component wherein the methacrylate component does not comprise a polyhedral oligosilsesquioxane moiety is supported by the original disclosure. As a result, Applicant respectfully asserts that currently amended claim 22 complies with the written description requirement of 35 U.S.C. § 112, first paragraph and respectfully requests that the Examiner withdraw the present rejection. As claims 23-28 and 30-37 depend from and further limit or otherwise incorporate the limitations of claim 22, Applicant respectfully assert that these claims comply with the written description requirement and respectfully requests that the Examiner withdraw the present rejection of these claims as well.

Claims 1-5, 8-10, and 13 and 35 U.S.C. § 102(b)

Claims 1-5, 8-10, and 13 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kita. Applicant has cancelled claims 1-5, 8-10, and 13 without prejudice to their reintroduction in a continuation application, in order to obtain earlier allowance of the remaining claims. The cancellation of these claims renders the present rejection moot.

Claims 60, 63 and 64 and 35 U.S.C. § 102(b)

Claims 60, 63, and 64 are rejected under 35 U.S.C. § 102(b) as being anticipated by Aoai. Applicant has cancelled claims 60, 63, and 64 without prejudice to their reintroduction in a continuation application, in order to obtain earlier allowance of the remaining claims. The cancellation of these claims renders the present rejection moot.

Claims 72 and 73 and 35 U.S.C. § 102(e)

Claims 72 and 73 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Seino. Specifically, the Examiner states that Seino teaches a poly(methyl methacrylate) resin containing silica particulate comprising an oxide other than a polyhedral oligosilsesquioxane. Applicant has amended claim 72 by removing the claim limitation reciting an oxide other than a polyhedral oligosilsesquioxane. The amendment to claim 72 renders the present rejection moot, and Applicant respectfully requests that the Examiner withdraw the rejection of claim 72.

Similarly, Applicant has amended claim 73 by removing the recitation of a polymer component comprising poly(methyl methacrylate). The amendment to claim 73 renders the present rejection moot, and Applicant respectfully requests that the Examiner withdraw the rejection of claim 73.

Claim 12 and 35 U.S.C. § 103(a)

The Examiner rejected claim 12 as being unpatentable under 35 U.S.C. § 103(a) over Kita. Applicant has cancelled claim 12 without prejudice to its reintroduction in a continuation application, in order to obtain earlier allowance of the remaining claims. The cancellation of claim 12 renders the present rejection moot.

Claims 6, 7, 11, 14-21, 62, 74-78, and 80-82 as Allowable Subject Matter

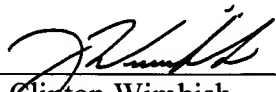
Applicant has amended claims 6, 14, and 62 in accordance with the Examiner's suggestion to place these claims in condition for allowance. As claim 7 depends from and further limits currently amended claim 6, Applicant respectfully asserts that claim 7 is in condition for allowance. Similarly, as claims 15-21, 74-78, and 80-82 depend from and further limit claim 14, Applicant respectfully asserts that these claims are in condition for allowance.

CONCLUSION

Applicant respectfully requests that the foregoing amendment and remarks be considered and entered so as to place the pending claims in condition for allowance. The Examiner is respectfully invited to contact J. Clinton Wimbish at (336) 607-7399 to discuss any matter relating to this application.

Respectfully submitted,

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Date


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